

Syllabus

Course description

Course title	Advanced Statistics
Course code	47006
Scientific sector	SECS-S/02
Degree	Environmental Management of Mountain Areas
Semester	I
Year	I
Academic year	2018/19
Credits	3
Modular	No

Total lecturing hours	20
Total lab hours	
Total exercise hours	10
Attendance	Not required, but strongly suggested
Prerequisites	Basic statistics at a Bachelor course level
Course page	See ole.unibz.it https://next.unibz.it/en/faculties/sciencetechnology/master-environmental-management-mountain-areas/course-offering/

Specific educational objectives	<ul style="list-style-type: none"> • deal with higher dimensional data; • analyze their own data statistically and to present them graphically; • judge critically scientific results and conclusions; • use specific functions of the statistical software package R; • apply methods of inferential statistics.
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Lecturer	Verena Barbieri
Scientific sector of the lecturer	Biostatistics (applied medical statistics)
Teaching language	English
Office hours	See Timetable on unibz web page
Teaching assistant (if any)	-
Office hours	Wed. 19.00-20.00
List of topics covered	<ol style="list-style-type: none"> 1. Repeating of statistical basics 2. Hypothesis and p- value 3. Tests for differences in means 4. Experimental study design, sample size estimation 5. Correlation and Regression 6. Counts, Proportions, Binary response and Logistic regression 7. Multiple regression and ANOVA 8. Generalized Linear Models, Mixed Models 9. Reliability analysis and Log rank test

	10. Time series analysis
Teaching format	Frontal lectures and exercises on PC in R

Learning outcomes	<p>Knowledge and understanding Understand the meaning of a statistical hypothesis and know how to find the correct and best way to test it. Know the meaning of an experimental study design and understand the necessary steps from planning a study to the presentation of the final results</p> <p>Applying knowledge and understanding Be able to read a scientific publication and to critically interpret and evaluate the results and conclusions. Be able to plan and conduct a scientific publication statistically, using the correct statistical methods, to implement them in R and to present them in a comprehensive way Be able to deal with higher dimensional data and to calculate sample sizes for specific statistical questions</p> <p>Making judgements Interpretation of complex statistical outputs, and critical reading of scientific publications</p> <p>Communication skills Ability to present statistical output in numbers, words and graphically, using the correct terminology</p> <p>Learning skills Learn to retrieve information out of the statistics of a study as well as to choose the correct statistical method to plan and conduct a study themselves. learn to use R to calculate complex statistics on higher dimensional data as well as on large data sets</p>
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Assessment	Written exam , 90 minutes, no books, electronic devices and team work
Assessment language	English
Evaluation criteria and criteria for awarding marks	Written exam 90 minutes: there are to answer several questions, the understanding of the methods is checked and their correct application in specific cases. the understanding of an experimental study design is checked

Required readings	Teacher's slides
Supplementary readings	